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Midwifery continuity of carer in an area of high socio-economic disadvantage in London: a retrospective analysis of Albany Midwifery Practice outcomes using routine data (1997-2009)

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ABSTRACT

Objective: In 1997, The Albany Midwifery Practice was established within King's College Hospital NHS Trust in a South East London area of high social disadvantage. The Albany midwives provided continuity of care to around 216 women per year, including those with obstetric, medical or social risk factors. In 2009, the Albany Midwifery Practice was closed in response to concerns about safety, amidst much publicity and controversy. The aim of this evaluation was to examine trends and outcomes for all mothers and babies who received care from the practice from 1997-2009.

Design: A retrospective, descriptive analysis of data routinely collected over the 12.5 year period was undertaken including changes over time and outcomes by demographic features.

Setting and participants: All women booked with the Albany Midwifery Practice were included.

Findings: Of the 2,568 women included over the 12.5 year period, more than half (57%) were from Black, Asian and Minority Ethnic (BAME) communities; one third were single and 11.4% reported being single and unsupported. Almost all women (95.5%) were cared for in labour by either their primary or secondary midwife. There were high rates of spontaneous onset of labour (80.5%), spontaneous vaginal birth (79.8%), homebirth (43.5%), initiation of breastfeeding (91.5%) and breastfeeding at 28 days (74.3% exclusively and 14.8% mixed feeding). Of the 79% of women who had a physiological third stage, 5.9% had a postpartum haemorrhage. The overall rate of caesarean section was 16%. The preterm birth rate was low (5%). Ninety-five percent of babies had an Apgar score of 8 or greater at 5 minutes and 6% were admitted to a neonatal unit for more than two days. There were 15 perinatal deaths (perinatal mortality rate of 5.78 per 1000 births); two were associated with significant congenital abnormalities. There were no intrapartum intrauterine deaths.

Key conclusions: This analysis has shown that the Albany Midwifery Practice demonstrated positive outcomes for women and babies in socially disadvantaged and BAME groups, including those with complex pregnancies and perceived risk factors.

Implications for practice: Consideration should be given to making similar models of care available to all women.

Keywords: Albany Midwifery Practice, BAME outcomes, home birth, midwifery continuity of carer, caseload midwifery, midwives, midwifery practice, normal birth, social disadvantage

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HIGHLIGHTS

The Albany Midwifery Practice was established within King's College Hospital NHS Trust in a South East London area of high social disadvantage and provided care to 2,568 women from 1997 until 2009.

- The caseload included high proportions (57%) of women from Black, Asian and Minority Ethnic communities.
- Midwifery continuity of carer was high with almost all women (95.5%) being attended in labour by their primary or secondary midwife.
- Spontaneous birth rates were high (79.8%) with a low caesarean section rate (16%). Overall, 43.5% of women gave birth at home.
- Neonatal outcomes were positive with 95% of babies having Apgar scores of >8 at 5 minutes; 6% spending greater than 2 days in the NNU. There were 15 perinatal deaths and no intrapartum intrauterine deaths.

BACKGROUND

In 2016, *Better Births*, the five-year forward view for maternity care in England, proposed major changes to how maternity care is delivered. Key recommendations included "... continuity of carer, to ensure safe care based on a relationship of mutual trust and respect in line with the woman's decisions. Every woman should have a midwife, who is part of a small team of 4 to 6 midwives, based in the community who knows the woman and family, and can provide continuity throughout the pregnancy, birth and postnatally"(p. 9) (NHS England 2016).

This policy directive was a response to reports of fragmented care, seen increasingly in high income countries where relationships have been replaced by technology (Davis-Floyd 2001; Mander & Murphy-Lawless 2013). The report cited robust evidence identifying the benefits of midwifery continuity of carer for mothers and babies in terms of improving safety, clinical outcomes, and positive experiences for women (Sandall et al. 2016).

There is now considerable evidence – from randomised controlled trials as described above (Sandall et al. 2016), descriptive and comparative analyses (McIntyre 2012; Page et al. 1999; Tracy et al. 2014) and qualitative studies (de Jonge et al. 2014 ; Leap et al. 2010) as to the benefits of midwifery continuity of care for women, midwives and the health system (Homer 2016). In light of the evidence supporting midwifery continuity of care, the World Health Organization's guidelines on antenatal care (WHO 2016) recently recommended that: "*Midwife-led continuity-of-care models, in which a known midwife or small group of known midwives supports a woman throughout the antenatal, intrapartum and postnatal continuum, are recommended for pregnant women in settings with well-functioning midwifery programmes*" (p.89).

Despite the benefits, implementation and scale-up, so that every woman benefits from a continuity of carer model of care, has been challenging in many countries. However, learning from previous models operating in the United Kingdom (UK) may assist this process. In the early 1990s, in response to government documents encouraging more choice, control and continuity of care for childbearing women in England (Department of Health 1993; House of Commons 1992), a group of six midwives, based in a community centre in Deptford, established the South East London Midwifery Group Practice and negotiated the first National Health Service (NHS) contract between a local health authority and self-employed midwives. They successfully applied for NHS funding to address inequalities in health and promote long term health gain through the provision of community based, continuity of midwifery carer throughout the childbearing period (caseload practice model) to groups of women known to have poor health outcomes due to various forms of disadvantage (Reed & Walton 2009).

The Albany Midwifery Practice

In 1997, the South East London Midwifery Group Practice negotiated a new contract with the King's College Hospital NHS Foundation Trust, who agreed to indemnify the midwives in accordance with clinical protocols and Trust policies (Reed & Walton 2009). The Practice changed its name to the Albany Midwifery Practice and became one of eight NHS midwifery group practices providing midwifery continuity of care within the King's maternity service (Demilew 2007).

The contract with King's College Hospital (King's) specified that the Albany Midwifery Practice was to provide midwifery care to 216 women per year (36 women per whole time equivalent midwife). The practice was based in the community in Peckham, an area within

the South East London borough of Southwark, which was ranked at that time as the 14th most deprived district of 354 districts in England (Sandall, Davies & Warwick 2001).

Compared to all other London Boroughs, Southwark had the highest proportion of: babies born with low or very low birth weights; babies of mothers born in East and West Africa and the Caribbean; and, babies of mothers who identified as sole parents during the Birth Registration process (Bowles, Walters & Jacobson 2007).

Access to the Albany Midwifery Practice was primarily for women registered with three General Practitioner (GP) practices (family medicine practices) based in a council (public) housing estate in Peckham. The midwives provided care for women, regardless of any perceived obstetric, medical or social risk, the understanding being that they would collaborate with obstetricians, other practitioners and both hospital and community based services as needed. The Albany midwives were an integrated part of the King's NHS maternity service and were thus able to directly access medical and social services and refer women to these at the point of need and at no cost.

Each woman who booked with the Albany Midwifery Practice was assigned two named midwives: a primary midwife responsible for providing and coordinating her individualised care and a second midwife. These two midwives provided antenatal, intrapartum and postnatal care up to 28 days following birth (Figure 1).

Figure 1: The Albany Midwifery Practice Model

- Woman assigned a primary and second midwife to provide antenatal, intrapartum and postnatal care up to 28 days post-partum.
- Primary midwife makes contact with the woman in early pregnancy to identify herself as

a point of contact for any queries prior to the booking visit.

- First antenatal visit (booking) in the woman's home – individualised plan of care made.
- Antenatal visits in the midwives' community based premises. If women referred for obstetric review or non-routine investigations, their midwife usually accompanies them to provide support and facilitate interdisciplinary working and a joint plan for care.
- Free, weekly antenatal groups facilitated by the midwives are available throughout pregnancy to all local women (including those not booked with the Albany midwives) for information sharing, peer support and community building (afternoon groups for women only and evening groups for women with or without partners).
- 36-week home visit ('The Birth Talk') – support in labour and during the postnatal period discussed with the woman and her supporters.
- Decision about place of birth flexible: from booking through to final decision in labour enabling decision making at each stage and consideration of a woman's progress, individual circumstances and wishes.
- Home visit/s in labour by midwives with all equipment needed for a homebirth.
- Labour, birth and immediate postnatal care provided by primary and/or second midwife, including when obstetric or other medical interventions necessary.
- Postnatal visits up to 28 days following birth – in hospital and/or the woman's home.
- Weekly postnatal support groups facilitated by Albany midwives in their premises, available to all local women (including those not booked with the Albany midwives) for women in the first few months following birth.

An independent evaluation of the Albany Midwifery Practice, commissioned by King's College Hospital, was conducted in 2001 (Sandall, Davies & Warwick 2001). This evaluation analysed clinical outcomes for only the first three years (1997-1999) and included 636 women. This showed that, when compared to other midwifery group practices at King's, the Albany Midwifery Practice had: a higher homebirth rate; a lower induction rate; a higher vaginal birth rate; a lower elective caesarean section rate; and a very high level of continuity (89% of women were attended during labour by their primary midwife and Albany midwives were in attendance at 98% of the births).

In 2007, an internal report by King's identified the important contribution that its eight midwifery group practices were making to the maternity unit's efforts to tackle health inequalities and promote wellbeing (Demilew 2007). The report drew on maternity service data for all women who booked and gave birth with King's in 2006 and cited the Albany Midwifery Practice's exceptionally high rates for: initiation of breastfeeding (99%), spontaneous vaginal birth (81.4%), and home birth (44.8%) and also its low caesarean section rate (15.2%).

Various qualitative studies have also commented on the positive experiences for women associated with the relational continuity of care provided by the Albany midwives (Huber & Sandall 2006, 2009; Kemp & Sandall 2010; Leap et al. 2009; Leap et al. 2010) and other models of caseload care (Beake et al. 2013; McCourt, Page & Hewison 1998). In 2009, however, the Albany Midwifery Practice was closed in response to concerns from the Trust about safety, amidst much publicity and controversy (AIMS 2010; Edwards & Davies 2010; Yiannouzis 2010).

In light of the unique nature of the Albany Midwifery Practice, its influence on policy (NHS 2007; UK Parliament 2000), practice and research, its high profile in the international midwifery arena, and the unresolved controversy around the closing of the practice (Edwards 2011; Walsh 2010), an independent examination of the maternal and neonatal outcomes over a period of 12 and a half years was seen critical, hence this evaluation was undertaken.

The objectives of this evaluation were to examine trends and outcomes for all mothers and babies who received care from the Albany Midwifery Practice from 1997-2009, specifically:

- Describe the birth outcomes for these women
- Analyse changes over time in the profile of women booking and in the outcomes for women and babies in three-four year increments over the 12 and a half year period
- Compare outcomes for women from Black, Asian and Minority Ethnic (BAME) groups with outcomes for White women (the BAME group included women from Black Caribbean, Black African, Black British, Asian (Indian), South East Asian and other minority ethnic groups.)

METHOD

Design and setting

The study design was a retrospective analysis of routinely collected data. As such, we ensured that it complied with the RECORD reporting guidelines identified for such analysis (Benchimol et al. 2015). The study was set in Peckham in South East London, which was an area of high social disadvantage.

As the study was classified as a service evaluation or audit, ethical approval was not required by the National Health Service at the time that data was collected for audit (Department of Health 2005). The data custodian is the former practice manager and has provided permission for these data to be analysed. The midwives who formerly worked in the Albany Midwifery Practice did not influence this evaluation and were only consulted on points of clarification or where additional data were required.

We chose not to include a control group as we did not have access to individual records for women who gave birth and were attended by midwives in the King's NHS Trust; it therefore would have been unfeasible to undertake to match appropriate controls over the time period.

Participants

All women who booked with the Albany Midwifery Practice during the study period were included. Women were excluded if they initially booked with the Practice but had subsequently:

- moved out of the area and given birth elsewhere
- had an elective termination of pregnancy

Variables, data sources and collection

During the period April 1997 to September 2009, data from over 2500 birth summary sheets (hand written by the Albany midwives) were entered onto the practice's database. The database was made available to the lead author (CH) for the purposes of conducting this independent analysis and shared with the research team.

The birth summary sheets identified the main variables used in this analysis, including: maternal demographics and past obstetric history; events and complications during pregnancy, labour and birth; breastfeeding and neonatal outcomes including gestation; Apgar scores; birth weight; admission to the neonatal unit (NNU); and perinatal mortality. Perinatal mortality was defined as stillbirths or neonatal deaths in the first 28 days of life in babies born at a gestation of 24 weeks or greater (Office for National Statistics (ONS) 2016).

A group of eight midwives, all of whom had worked in the Albany Midwifery Practice for several years, responded to queries regarding clarification about abbreviations, data collection processes, data anomalies and missing data. The midwives checked every tenth entry on the database against the original hand written birth summary sheets and were able to report the accuracy of neonatal outcomes for over 250 entries.

The database was then reviewed, duplicates were removed and final queries were generated. For some variables there are small numbers of missing data. These are explained where relevant in the tables.

We chose to use the practice database rather than the routine data collection systems in the King's NHS Trust. This was because the practice database was more consistent over time and access was more readily available to the researchers. The Albany midwives had always collected their own data in order to enable easy access for reviewing up to date outcomes and reflecting on these in their twice-weekly practice meetings (Reed & Walton 2009).

Outcomes for individual women booked with the Albany midwives could only be done through the Albany database, including, for example, data on reasons for transfer; breastfeeding postnatally; and midwifery continuity of carer.

Data analysis

Data were analysed using IBM-SPSS software and were undertaken by Author #1 who was not connected with, and had never worked in, the Albany Midwifery Practice.

Initially, to determine whether there had been changes over time in the profile of women booking with the AMP, an analysis of the key demographic variables by year was undertaken (ethnicity, age, support status, housing, parity, previous CS).

As the proportion of women from Black, Asian and Minority Ethnic (BAME) communities was known to be considerably higher than the background rates in the UK, we undertook an analysis comparing the outcomes for BAME and White women who received care from Albany midwives.

FINDINGS

In total, there were 2568 women who were booked with the Albany Midwifery Practice over the time period. The mean age of women was 30 years (range 14-50 years). Four percent of women were less than 20 years of age. Just over one third (36%) were considered White with more than half (57%) from BAME groups, including women with mixed ethnicity. More than one third of women (35%) lived in council (public) housing and one third were single with 11% overall reporting that they were single and unsupported.

Maternal outcomes

More than half of women (57%) were multiparous; of these, the proportion who had had a previous caesarean section was 18%. The proportion of women with medical risk factors (for example, hypertension and diabetes) was low.

<Table 1 here>

Just over one quarter of women (28%) specifically planned a homebirth at their initial visit with the Albany midwives. This increased to 38% at the 36-week visit. Ultimately, 43.5% of women gave birth at home with an additional 18 women (0.7%) giving birth at home before the arrival of the midwife (Table 2).

<Table 2 here>

Almost all women (95.5%) were cared for in labour by either their primary or secondary midwife: The vast majority of women (87.1%, n=2236) had their primary midwife at their birth (Table 2).

Most women (80.5%) commenced labour spontaneously and 6.5% had an induction of labour. One third (30.3%) used water immersion for labour (17.3% gave birth into water) and the use of analgesia was low (only 9.9% of women used epidural analgesia; 1.2% were given Pethidine and 15.4% used Entonox). Fifteen per cent of women were transferred to hospital during labour, mostly for slow progress in labour (7.7%). Three percent of women were transferred due to concerns about fetal wellbeing.

Overall, 79.8% of women had a spontaneous birth with an overall caesarean section (CS) rate of 16%. Of the 84% of women who had a vaginal birth (spontaneous and instrumental), 78% had a physiological third stage of labour with 5.9% of these women having a postpartum haemorrhage (PPH) (blood loss >500mL). The overall PPH rate for all births was 14% (2.3% had a blood loss of 1000 - 1500mL and 0.5% had a blood loss of >1500mL). Two thirds of women who had a vaginal birth had no perineal trauma (62.2%) (Table 3). Sixteen women (0.7%) were recorded as having had a third degree tear and there were no fourth

degree tears. Data collected for third degree tears included any tears involving the anal sphincter – this was a definition used when the database was set up; data collection was not amended after the Royal College of Obstetricians and Gynaecologists first published guidelines defining fourth degree tears in 2001 (RCOG 2015).

<Table 3 here>

Neonatal outcomes

In total, there were 2585 babies born including 21 sets of twins and one set of triplets. Most babies (93.8%) were born at full term with a preterm birth rate (<37 weeks) of 5.1%. Fewer than 5% of babies (4.5%) were low birth weight (<2500gms).

Most babies (94.8%) had an Apgar score of 8 or greater at 5 minutes and 6.2% (n=160) were admitted to a Neonatal Unit (NNU) for more than two days. The most frequent reasons for admission were being preterm (n=51) and low Apgar score/hypoxia (n=54).

Almost all women commenced breastfeeding at birth (91.5%) with three-quarters of women (74.3%) overall exclusively breastfeeding at 28 days. An additional 14.8% were practising mixed feeding by this time (Table 4).

<Table 4 here>

There were 15 perinatal deaths, which included 7 antenatal intrauterine deaths and 8 neonatal deaths (NND). There were no intrapartum deaths: all of the seven stillbirths occurred before the onset of labour. Of the 15 perinatal deaths, one was at 24 weeks, three were at 29-34 weeks, two at 35-36 weeks and nine at 37-42 weeks gestation (Table 5). Five deaths were in babies whose mother had a previous CS (two stillbirths and three NNDs) and 11 were babies in women from minority ethnic groups (Black or Asian) (six stillbirths and

five NNDs). Of the 8 NNDs, one was a baby with significant renal dysplasia and another was a baby with a cerebral tumor.

<Table 5 here>

Sub-group analyses by parity

We examined selected outcomes by parity. Multiparous women were more likely to be older, from a Black, Asian and Minority Ethnic group, less likely to require transfer in labour and more likely to have a homebirth (Table 6).

<Table 6 here>

Changes over time

There were a few changes during the 12.5 years that the Albany Midwifery Practice was operating. These were examined in 3-4 year blocks (Table 7). The proportion of women identifying their ethnicity as White decreased significantly over time accounting for just over one third of women by 2006-2009.

The rate of women with a previous CS and those who ultimately had a CS did not change significantly over the 13 years. There were a number of practice changes over time: the rate of waterbirth increased as did the proportion of women who were planning a homebirth at the 36 week home visit. There were no differences in the proportion of babies admitted to a NNU.

The perinatal mortality rate varied over the time periods (1.8-7.7 per 1000 live births) although the absolute numbers were small (1-6 babies per time period).

<Table 7 here>

Outcomes for women from Black, Asian and Minority Ethnic (BAME) Groups

Given the high proportion of BAME women accessing the Albany Midwifery Practice, we analysed specific outcomes for this group and compared these with women who identified as being from White ethnic groups (Table 8). BAME women were more likely to be younger, single, living in council (public) housing and be multiparous than White women. They were also less likely to have a homebirth or have a spontaneous vaginal birth. Their babies were more likely to be born preterm or be of low birth weight. While there were no differences in the initiation of breastfeeding, by 28 days, BAME women were more likely to be mixed feeding and less likely to be exclusively breastfeeding compared with White women.

<Table 8 here>

DISCUSSION

We undertook this retrospective audit to examine the trends and outcomes for all mothers and babies who received care from the Albany Midwifery Practice during 12 and a half years, from 1997-2009. The Albany Midwifery Practice is a model that was emulated and used as a template for other midwife-led services around the world before the contract was terminated in 2009 due to safety concerns (Yiannouzis 2010). This was highly controversial in the local community and in midwifery circles and led to a number of commentaries in relation to the decision (AIMS 2010; Edwards 2011; Edwards & Davies 2010; Walsh 2010).

Significant proportions of women attending the Albany Midwifery Practice were from BAME groups and/or single, both characteristics associated with poorer neonatal outcomes (Raleigh et al. 2010). This is in keeping with the local population which is highly ethnically diverse. In 2006, the ethnic profile of women using King's College Hospital maternity

services included 42% who identified as Black African or Caribbean and only 43% who identified as White British (Demilew 2007). This is more diverse than in greater London where from the most recent data, 60% of people residing in London are White British with 13% being Black/African/ Caribbean/ Black British (13%) and 19% being Asian/Asian British Indian and 5% identifying as Mixed/ Multiple Ethnic Groups (Office for National Statistics 2011).

It has been shown that women from BAME groups and single women are at higher risk of adverse outcomes during pregnancy and after. For example, these women are more likely to experience complications during pregnancy, an unplanned caesarean section, and having their baby cared for in a neonatal unit than those from the White British group (Raleigh et al. 2010). Babies of Black or Black British and Asian or Asian British ethnicity have also been shown to have the highest risk of extended perinatal mortality with rates of 9.8 and 8.8 per 1,000 total births respectively (Manktelow et al. 2015). These rates are considerably higher than the Albany rate of less than 2.0 per 1000 births in women from BAME groups (Table 8). In addition, in a UK survey, women in all minority ethnic groups had a poorer experience of maternity services than White women (Henderson, Gao & Redshaw 2013) and expressed more worries about labour and birth (Redshaw & Heikkilä 2011). While our study did not examine women's experiences, the fact that they chose this care and had positive labour and birth outcomes suggests that they felt supported by the Albany Midwifery Practice. This is in keeping with a qualitative study where women from BAME backgrounds in an inner-city area identified that receiving caseload care enhanced the emotional social support they received from midwives, enabling them to feel safe, relaxed and able to confide about problems within a trusting relationship (Beake et al. 2013).

The preterm birth rate in our study was low (5.1%) with 94.8% of babies having an Apgar score of 8 or greater at 5 minutes and 6.2% admitted to a NNU for more than two days.

There were 15 perinatal deaths over this period giving a perinatal mortality rate of 5.78 per 1000 total births. Two of the deaths were associated with significant congenital abnormalities and there were no intrapartum intrauterine deaths.

The perinatal mortality data for babies born through the Albany Midwifery Practice were lower than the rates for the United Kingdom over a similar period, where from 2000-2009, the perinatal mortality rate ranged from 7.5-8.5 per 1000 total births (Centre for Maternal and Child Enquiries (CMACE) 2011). The perinatal mortality rate in the Albany Midwifery Practice varied over the time period (1.8-7.7 per 1000 total births) although the absolute numbers were small (1-6 babies per 3-4 year time period). In addition, the rate of preterm births is lower than the national average. Between 2006-2010, the rate of preterm birth in the UK was 7-7.5% (Office of National Statistics 2012); higher than the 5.1% rate in the Albany Midwifery Practice.

Our audit has shown that the Albany Midwifery Practice supported high rates of physiological births, a phenomenon described in a small study of midwifery caseload practice for similarly socially disadvantaged women (Rayment-Jones, Murrells & Sandall 2015). In more than 12 years, almost 80% of women had spontaneous vaginal births and 16% had caesarean sections (12.2% emergency CS and 3.8% elective CS). The average caesarean section rate across England over that time ranged from 17-25% highlighting the lower rates in the Albany Midwifery Practice (Health and Social Care Information Centre 2013).

The low incidence of birth assisted by forceps or ventouse (4.2%) may have been related to only 10% of women having an epidural in labour, given the identified increased risk of assisted vaginal birth associated with epidural analgesia (Anim-Somuah, Smyth, & Howell, 2005). Only 1.2% of women were given Pethidine and 15% used Entonox. Almost all women (95.5%) were supported by known midwives highlighting the value of midwifery continuity of care as a strategy to help women cope with pain as part of normal childbirth (Leap et al. 2010; Sandall et al. 2016; Sanders & Lamb 2014; Van der Gucht & Lewis 2015).

In this study, most women commenced labour spontaneously (80.5%) and only 13.6% of labours involved induction, stimulation or augmentation of labour. The majority of women had no perineal trauma (62.2%); third degree tears were rare (0.7%), and the episiotomy rate was 3.8%. These results lend weight to evidence linking perineal trauma with episiotomy, induction of labour, epidural analgesia and assisted vaginal birth (Kudisha, Sokolb & Kruger 2008; Räisänen, Vehviläinen-Julkunen & Heinonen 2010). There has been a suggestion that, where midwives reduce the number of episiotomies they perform, they tend to gain skill in preserving the woman's perineum intact (Begley 2014). Data on the techniques used by Albany midwives were not collected; this raises the importance of recording such information so that it can be examined retrospectively in order to contribute to research in this area (Petrocnik & Marshall 2015).

The majority (79%) of women who had a vaginal birth had a physiological third stage of labour. Of interest is that only 5.9% of women in this group had a blood loss of more than 500ml. Similar outcomes have been recorded in large studies in New Zealand (Davis et al. 2012; Dixon, Skinner & Foureur 2013). It has been suggested that midwives who are experienced in physiological third stage may have skills that protect women from excessive

blood loss in normal labour (Begley 2014; Begley et al. 2012; Jangsten, Hellström & Berg 2010).

Almost all (95.5%) women were attended in labour by their primary midwife or secondary midwife who they had got to know during pregnancy. Strong evidence has linked this relational continuity of care, often referred to as 'caseload midwifery,' to a reduction in the use of epidurals, episiotomies, instrumental births and pre-term births (Sandall et al. 2016). Caseload midwifery for women of any risk has also been associated with a reduction in elective CS, the use of pharmacological analgesia, induction of labour, and birth related blood loss, with an increase in the likelihood of continued breastfeeding after six weeks and six months and cost savings (Tracy et al. 2013).

The breastfeeding rates in women cared for by the Albany midwives were high: 91.5% initiated breastfeeding and 74.3% were still exclusively breastfeeding at 28 days (an additional 14.8% were mixed feeding). The promotion of breastfeeding is an important aspect of the public health role of midwives, with implications for addressing health inequalities and potential health gain (Department of Health 2007a, 2010; Pokhrel et al. 2015).

The results of this audit add to the body of literature questioning the routine use of medico-technical interventions in labour (Begley 2014; Johanson, Newburn & Macfarlane 2002). They are of particular interest given that the women who accessed the Albany Midwifery Practice included those with pregnancies considered to be at all levels of obstetric, medical and social risk. Furthermore, the profile of the 2,568 women reflected that of the local population in Southwark, a high proportion being in groups considered to be most vulnerable in terms of socio-economic disadvantage and poor maternity outcomes

(Department of Health 2007b; Manktelow et al. 2015; Office for National Statistics 2016). In particular, women from BAME communities and single, unsupported mothers are more likely than White British women to experience complications, adverse outcomes, worry, and poor experiences of care during pregnancy and afterwards (Henderson, Gao & Redshaw 2013; Raleigh et al. 2010; Redshaw & Heikkilä 2011).

Midwifery continuity of carer can play an important role in addressing the needs of vulnerable women through the opportunity to build trusting relationships and access to safe, supportive services (Beake et al. 2013; Beake, McCourt & Page 2001; Department of Health 2010; Manktelow et al. 2015; McCourt & Pearce 2000; ten Hoope-Bender 2013). In previous studies, women who received care from Albany midwives have described a sense of calm and trust that this type of relational continuity of care engendered (Huber & Sandall 2009). This gave them a chance to develop self-confidence as they approached the challenges of labour and new motherhood, including breastfeeding (Huber & Sandall 2009; Leap et al. 2010).

One of the distinguishing features of the Albany Midwifery Practice model is access to, and support of, homebirth. The percentage of women who gave birth at home with the Albany midwives was 43.5%. Government documents in England have consistently promoted the idea that healthy women should be offered the choice of giving birth at home (Department of Health 1993, 2004, 2007a); yet home birth has remained relatively uncommon over the years (below 3% in England). A large study comparing perinatal outcomes by planned place of birth (Birthplace in England Collaborative Group 2011) supported a policy of offering women with low risk pregnancies a choice of birth settings, including birth at home (NICE

2014). Despite such policy directives, the rates of homebirth remain static at 2.3% in 2012 and 2013 in England and Wales (Office for National Statistics 2014).

The Albany midwives' practice included developing a positive culture around birth at home in the local community (Reed 2015). The option to give birth at home remained open, including during labour, hence the changing proportion of women choosing this option as their pregnancies progressed. Caseload midwifery may allow more time and space for decision making to emerge fully, especially where home assessment in early labour allows for women to choose to stay at home or go to hospital, depending on how their labour is unfolding (Brintworth & Sandall 2012).

Of the women who chose to give birth at home, 15.1% experienced transfer to hospital in labour (12.4% primiparous, 5.5% multiparous women). The implications of this are significant given the rates of transfer from home to an obstetric unit identified in the Birthplace in England (Birthplace in England Collaborative Group 2011) study: 45% for primiparous women and 12% for multiparous women.

The proportion of women from BAME communities who gave birth at home with Albany midwives was lower than the proportion of White women. However, the fact that around one third of women from BAME groups gave birth at home is significant in light of the Birthplace in England Study (Birthplace in England Collaborative Group 2011), which identified that women choosing to give birth at home were less likely to be in BAME groups.

We examined the data over 3-4 year time periods to see whether there were differences in demographic characteristics, practice and outcomes. The proportion of women identifying their ethnicity as White decreased significantly over time. It is interesting that over this

time, the rate of waterbirth increased as did the proportion of women who planned a homebirth at 36 weeks. This could be explained by the growing confidence of the general population in the concept of waterbirth and the development of a local culture where birth at home with known midwives was seen as a normal and positive option for healthy women with uncomplicated pregnancies (Leap et al. 2010; Reed 2015). An increase in the rate of homebirth is in contrast to practices in the majority of countries, where homebirth has decreased. For example, the home birth rate in the Netherlands is the highest in high income countries, although it has declined from 35 percent of all births in 1997 to 2000 to 16 percent of all births in 2013 despite strong evidence showing safety (Birthplace in England Collaborative Group 2011; de Jonge et al. 2015). It is important to note that there were no significant changes in the rate of admission to a neonatal unit over these time periods.

Limitations of this study

This study has involved the analysis of retrospective data and there was a small amount of missing data for some variables, particularly around reasons for admission and length of stay on the neonatal unit. Using a practice database of retrospective data is a limitation as the database was not primarily established for the purpose of an evaluation such as this although it was anticipated that it would be used for ongoing quality review.

Another limitation is the lack of a comparison group. As described earlier, this was seen as unfeasible and potentially unhelpful, as the demographic characteristics would likely have been difficult to match. Therefore, the analysis is limited to being a single group description.

It is impossible to draw conclusions about perinatal mortality, given the small numbers involved, although there is no evidence that this increased over the period studied. Data on morbidity were not collected and we have to rely on (previously cited) qualitative studies identifying women's experience of care from Albany midwives, since these data were not collected routinely by the practice. Nonetheless, the vocal campaigns from women after the closure would suggest that many were highly satisfied with the services provided (Edwards 2011).

CONCLUSION

An analysis of retrospective Albany Midwifery Practice statistics over 12.5 years has shown positive outcomes for women and babies in socially disadvantaged and BAME groups, including those with complex pregnancies and perceived risk factors. This study adds weight to a growing body of evidence linking relational midwifery continuity of carer with improved outcomes and policies identifying that all pregnant women should receive midwifery continuity of carer throughout the continuum of pregnancy, birth and new motherhood.

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Table 1: Demographic details of the women booked with the Albany Midwifery Practice (1997-2009)

| | N=2568 | % |
|--|--------|------|
| Age group at birth | | |
| • 14-19 | 113 | 4.4 |
| • 20-25 | 426 | 16.6 |
| • 26-30 | 665 | 25.9 |
| • 31-35 | 775 | 30.2 |
| • 36-40 | 473 | 18.4 |
| • 41-50 | 85 | 3.3 |
| • Unknown | 31 | 1.2 |
| Ethnicity | | |
| • White | 935 | 36.4 |
| • Black African | 847 | 33.0 |
| • Black Caribbean | 245 | 9.5 |
| • Black British | 147 | 5.7 |
| • Asian (Indian sub-continent and SE Asia) | 217 | 8.5 |
| • Mixed | 71 | 2.8 |
| • Other | 93 | 3.6 |
| • Unknown | 13 | 0.5 |
| Living in public housing | 918 | 36.2 |
| Relationship status at booking | 293 | |
| • In a relationship (married/de facto partner) | 1631 | 63.5 |
| • Single but supported by others | 582 | 22.7 |
| • Single, unsupported | 293 | 11.4 |
| • Unknown/Other | 62 | 2.4 |
| Parity | | |
| • Primiparity (expecting first baby) | 1100 | 42.8 |
| • Multiparity (expecting second or subsequent) | 1468 | 57.2 |
| Previous CS (only in multiparous women) | 269 | 18.2 |
| Maternal and fetal risk factors | | |
| • Hypertension in pregnancy | 67 | 2.6 |
| • Diabetes | 18 | 0.7 |
| • Placenta previa | 10 | 0.4 |
| • APH/Abruption/bleeding | 25 | 1.0 |
| • Post dates | 34 | 1.3 |
| • Multiple pregnancy | 18 | 0.7 |
| • IUGR/abnormal dopplers | 48 | 1.9 |
| • Preterm labour | 17 | 0.7 |
| • Fetal abnormality | 10 | 0.4 |
| • PROM | 26 | 1.0 |
| • Infections - UTI, malaria, varicella | 10 | 0.4 |
| • Other | 174 | 6.8 |

*Other includes social and emotional issues, mental health disorders and other medical conditions

Table 2: Planned place of birth – at booking and 36 weeks and ultimate place of birth for women booked with the Albany Midwifery Practice (1997-2009)

| | N=2568 | % |
|-------------------------------------|--------|------|
| Preferred place of birth at booking | | |
| • Home | 722 | 28.1 |
| • Hospital | 915 | 35.6 |
| • Unsure | 750 | 29.2 |
| • Not recorded | 181 | 7.0 |
| Planned place of birth at 36 weeks | | |
| • Home | 985 | 38.4 |
| • Hospital | 1129 | 44.4 |
| • Unsure | 305 | 11.9 |
| • Not recorded | 149 | 5.8 |
| Actual place of birth | | |
| • Home | 1118 | 43.5 |
| • Hospital | 1431 | 55.7 |
| • Born before arrival of midwife | 18 | 0.7 |
| • Not recorded | 1 | 0.0 |
| Primary midwife at birth | 2236 | 87.1 |

Table 3: Labour and birth outcomes for women booked with the Albany Midwifery Practice (1997-2009)

| | N=2568 | % |
|--|--------|------|
| Type of labour | | |
| • Spontaneous onset | 2066 | 80.5 |
| • Induced | 168 | 6.5 |
| • Augmented | 119 | 4.6 |
| • Stimulated | 61 | 2.4 |
| • No labour – elective CS | 99 | 3.9 |
| • Not recorded | 59 | 2.2 |
| Analgesia in labour and/or birth# (n=2416) | | |
| • Entonox | 373 | 15.4 |
| • Pethidine | 30 | 1.2 |
| • Epidural analgesia | 240 | 9.9 |
| Use of the pool# (n=2416) | | |
| • Use of water in labour (pool or bath) | 731 | 30.3 |
| ○ Gave birth in water | 419 | 17.3 |
| Transfer to hospital in labour* (n=1209) | 183 | 15.1 |
| • Slow progress in labour | 91 | 7.5 |
| • Fetal concerns (fetal distress or meconium) | 41 | 3.4 |
| • Third stage concerns (retained placenta or PPH) | 16 | 1.3 |
| • Other | 35 | 2.8 |
| Type of birth | | |
| • Spontaneous vaginal birth (incl breech – n=44) | 2048 | 79.8 |
| • Forceps/ventouse | 109 | 4.2 |
| • Caesarean section | 411 | 16.0 |
| ○ Emergency Caesarean | 313 | 12.2 |
| ○ Elective Caesarean | 98 | 3.8 |
| Perineal trauma** (n=2134) | | |
| • None or graze | 1329 | 62.2 |
| • 1 st degree tear | 283 | 13.3 |
| • 2 nd degree tear | 423 | 19.8 |
| • 3 rd degree tear | 16 | 0.7 |
| • Episiotomy | 82 | 3.8 |
| Management of the third stage of labour** (n=2134) | | |
| • Physiological | 1687 | 79.0 |
| • Active | 418 | 19.6 |
| • Unknown | 29 | 1.4 |
| Estimated blood loss immediately after birth | | |
| • <500mL | 2211 | 86.1 |
| • 500-1000mL | 286 | 11.1 |
| • 1000-1500mL | 59 | 2.3 |
| • >1500mL | 12 | 0.5 |
| Postpartum haemorrhage# (vaginal birth only**) | 128 | 5.9 |

#Only women with spontaneous, induced, augmented or stimulated labour included. Women with an elective or planned CS were excluded.

*Only women who planned a homebirth were included

**Only women who had a vaginal birth (spontaneous, instrumental or breech) were included

#PPH = >500mL

Table 4: Outcomes (>24 weeks gestation) for babies born to women booked with the Albany Midwifery Practice (1997-2009)

| Neonatal outcomes | N=2585 | % |
|--|---------------|----------|
| Gestation at birth (weeks) | | |
| • 24-28 | 17 | 0.7 |
| • 29-34 | 38 | 1.5 |
| • 35-36 | 75 | 2.9 |
| • 37-42 | 2400 | 92.8 |
| • 43-44 | 27 | 1.0 |
| • Not recorded | 28 | 1.1 |
| Preterm birth (<37 weeks) | 130 | 5.1 |
| Low birth weight (<2500g)* | 117 | 4.5 |
| Five (5) minute Apgar score | | |
| • 8-10 | 2450 | 94.8 |
| • 7 and less | 106 | 4.1 |
| • Unknown | 29 | 1.1 |
| Admitted to a Neonatal Unit (NNU) >2 days | 160 | 6.2 |
| Breastfeeding at birth | 2364 | 91.5 |
| Exclusive breastfeeding at 28 days | 1920 | 74.3 |
| Breastfeeding (exclusive and mixed) at 28 days | 2302 | 89.1 |

*Birth weight not recorded for 223 babies

Table 5: Perinatal deaths for babies born to women booked with the Albany Midwifery Practice (1997-2009)

| | N=2585 | PMR per 1000 live births |
|--------------------|--------|--------------------------|
| Perinatal deaths # | 15 | 5.78 |
| • Stillbirths | 7 | |
| • Neonatal deaths | 8 | |

#Stillbirths and NND greater than 24 weeks gestation

Table 6: Age, ethnic group, transfer in labour and homebirth by parity for women booked with the Albany Midwifery Practice (1997-2009)

| | Primiparous N=1100 (%) | Multiparous N=1468 (%) | P |
|---|---------------------------|---------------------------|--------|
| Age (n=2537) | | | <0.001 |
| • 14-19 years | 94 (8.7) | 19 (1.3) | |
| • 20-30 years | 585 (54.2) | 506 (34.7) | |
| • 31-40 years | 380 (35.2) | 868 (59.6) | |
| • 41 years and greater | 21 (1.9) | 64 (4.4) | |
| Black, Asian and Minority Ethnic Groups | 672 (61.3) | 954 (64.7) | 0.1 |
| Transfer in labour | 136 (12.4) | 81 (5.5) | <0.001 |
| Homebirth rate (n=2389) | 388 (39.4) | 730 (52.0) | <0.001 |

Table 7: Changes in specific demographic variables, outcomes and practice changes in 3-4 blocks for women booked with the Albany Midwifery Practice (1997-2009)

| | 1997-1999 | 2000-2002 | 2003-2005 | 2006-2009 | p value |
|--|------------|------------|------------|------------|---------|
| Age groups (n=2539) | | | | | 0.05 |
| • 14-19 years | 20 (3.6) | 30 (5.0) | 37 (5.9) | 26 (3.4) | |
| • 20-30 years | 240 (43.6) | 261 (43.4) | 268 (43.1) | 320 (41.8) | |
| • 31-40 years | 276 (50.3) | 296 (49.3) | 286 (46.0) | 394 (51.4) | |
| • 41 years and greater | 14 (2.5) | 14 (2.3) | 31 (5.0) | 26 (3.4) | |
| Multiparity | 300 (53) | 353 (58.5) | 339 (53.9) | 476 (61.8) | 0.003 |
| Ethnicity (n=2558) ^{##} | | | | | <0.001 |
| • White | 254 (45.9) | 192 (31.8) | 215 (34.3) | 271 (34.9) | |
| • Black (includes Black Caribbean, Black African, Black British) | 229 (41.4) | 325 (53.9) | 326 (52.1) | 365 (47.0) | |
| • Asian (includes SE Asian) | 41 (7.4) | 49 (8.1) | 46 (7.3) | 81 (10.4) | |
| • Other | 29 (5.2) | 37 (6.1) | 39 (6.2) | 59 (7.6) | |
| Primiparity (n=1097) | 263 (46.9) | 250 (41.5) | 290 (46.1) | 299 (38.2) | 0.003 |
| Practice changes | | | | | |
| • Previous CS (n=2571) | 59 (10.5) | 72 (11.9) | 51 (8.1) | 88 (11.3) | 0.13 |
| • Use of the pool for birth (n=2522) | 63 (11.5) | 64 (10.6) | 120 (19.6) | 173 (22.7) | <0.001 |
| • Planned homebirth at 36w (n=2467) | 213 (38.6) | 205 (34.5) | 226 (38.7) | 342 (44.6) | <0.001 |
| • Caesarean section (n=2597) | 98 (17.2) | 100 (16.4) | 99 (15.7) | 127 (16.2) | 0.9 |
| • Exclusive breastfeeding at 28 days (n=2598) | 407 (71.4) | 406 (66.7) | 495 (78.3) | 618 (78.5) | <0.001 |
| • Admission to NNU | 26 (4.6) | 35 (5.9) | 46 (7.3) | 52 (6.7) | 0.25 |
| Perinatal outcomes | | | | | 0.54 |
| • Live births | 564 (99.8) | 605 (99.3) | 628 (99.4) | 781 (99.2) | |
| • Perinatal deaths | 1 | 4 | 4 | 6 | |
| PMR per 1000 live births | 1.77 | 6.57 | 7.62 | 5.78 | |

Table 8: Outcomes for Black, Asian and Minority Ethnic Groups compared with White ethnicities for women booked with the Albany Midwifery Practice (1997-2009)

| | Black, Asian and Minority Ethnic Groups* N=1620 (%) | White ethnic groups N=948 (%) | P value |
|--|--|----------------------------------|---------|
| Age | | | <0.001 |
| • 14-19 years | 84 (5.2) | 29 (3.1) | |
| • 20-30 years | 806 (50.3) | 285 (30.5) | |
| • 31-40 years | 666 (41.5) | 582 (62.3) | |
| • 41 years and greater | 47 (2.9) | 38 (4.1) | |
| Relationship status at booking | | | 0.001 |
| • In a relationship | 900 (55.6) | 731 (77.1) | |
| • Single but supported | 433 (26.7) | 149 (15.7) | |
| • Single, unsupported | 245 (15.1) | 48 (5.1) | |
| • Unknown/Other | 42 (2.6) | 20 (2.1) | |
| Living in council (public) housing | 768 (47.8) | 150 (16.1) | <0.001 |
| Primiparity | 674 (41.6) | 426 (44.9) | 0.1 |
| Actual place of birth | | | <0.001 |
| • Home | 550 (34.0) | 568 (59.9) | |
| • Hospital | 1056 (65.2) | 375 (39.6) | |
| • Born before arrival in hospital | 13 (0.8) | 5 (0.5) | |
| Epidural analgesia in labour | 146 (9.3) | 95 (10.2) | 0.7 |
| Type of birth | | | <0.001 |
| • Spontaneous vaginal birth (incl breech) | 1264 (78.0) | 784 (82.7) | |
| • Forceps/ventouse | 52 (4.2) | 57 (6.0) | |
| • Caesarean section | 304 (18.8) | 107 (11.4) | |
| ○ Emergency Caesarean | 233 (14.4) | 80 (8.5) | |
| ○ Elective Caesarean | 71 (4.4) | 27 (2.9) | |
| Preterm birth (<37 weeks) | 100 (6.2) | 30 (3.2) | <0.001 |
| Low birth weight (<2500g) | 90 (6.1) | 28 (3.2) | 0.002 |
| Breastfeeding at birth | 1471 (90.9) | 873 (92.1) | 0.3 |
| Exclusive breastfeeding at 28 days | 1126 (69.5) | 784 (82.7) | <0.001 |
| Breastfeeding (exclusive and mixed) at 28 days | 1459 (90.1) | 823 (86.8) | 0.01 |
| Admitted to a NNU>2 days | 112 (6.9) | 47 (5.0) | 0.05 |
| Perinatal deaths | 3 (0.3) | 12 (0.7) | 0.2 |

*BAME: Black Caribbean, Black African, Black British, Asian (Indian), South East Asian and other minority groups

Competing interests

CH has no competing interests to declare. NL was a founding member of the South East

London Midwifery Group Practice until 1996 and has not worked in the Albany Midwifery

Practice. She has undertaken qualitative research with the Albany Midwifery Practice (cited in this paper). JS undertook the first evaluation of the Albany Midwifery Practice in 2001 (cited in this paper) and is lead author of a Cochrane review on continuity of midwife care. NE has written extensively on the closure of the practice (many of these articles are cited in the paper).

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Authors' contributions

CH co-designed the evaluation, undertook the cleaning and checking of the data, led the analysis and co-wrote the initial draft.

NL co-designed the evaluation, wrote the sections describing the Albany Midwifery Practice and the history of the model and co-wrote the initial draft.

NE and JS provided advice on the design and analysis, assisted with the writing of the manuscript and approved the final version.

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Availability of data and materials

Given the nature of the data (being routinely collected data and owned by the practice) and the controversy over the closure of the practice and subsequent reviews, the data will not be more widely shared at this stage.